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CONTENTS

INTRODUCTION 1

Purpose 1
The Program
Scope of the Bibliography 1
Organization of the Bibliography 3
Availability of Documents 3

CITATIONS AND ABSTRACTS OF REPORTS 5

Federal Government

Indian and Northern Affairs Canada 5
Fisheries and Oceans 12
Environment Canada 15
Energy, Mines and Resources Canada 19
Transport Canada 22
Canadian Museum of Civilization 23

Government of Yukon

Education, Yukon Archives 27

Government of the Northwest Territories

Culture and Communications 27
Energy, Mines and Resources Secretariat 28
Municipal and Community Affairs 28
Renewable Resources 31
Social Services 35

INTRODUCTION

Purpose

This bibliography contains citations and abstracts for published and unpublished reports completed under the Northern Oil and Gas Action Program (NOGAP), mainly during 1986. These items have been funded wholly or partly by NOGAP.

One of NOGAP's operating objectives is to make its products widely known and available. This volume, the second of an intended series, is issued in support of this objective. It was compiled by the NOGAP Secretariat, Indian and Northern Affairs Canada with the assistance of Mrs. Margaret McGee, the NOGAP Coordinator for the Government of the Northwest Territories.

The Program

NOGAP is a seven-year (1984/85 to 1990/91) research and planning program to advance the state of federal and territorial government preparedness for major hydrocarbon development north of 60°.

Government preparedness for northern hydrocarbon production refers generally to acquiring the knowledge and analytical capability to make appropriate decisions concerning major northern development proposals. Preparedness requires the ability to evaluate environmental impacts and mitigate adverse ones; to develop guidelines and techniques to minimize hazards; to plan for additional public services and infrastructure, and to implement means of enhancing northern opportunities and benefits from hydrocarbon development.

NOGAP funds may be used either to accelerate work on current projects or to undertake new activities which existing ("A"-base) resources cannot accommodate. Projects are proposed by NOGAP participants to support their responsibilities in connection with northern hydrocarbon development. They are undertaken within the context of generic development scenarios that have been adopted for the program.

Scope of the Bibliography

The bibliography is multi-disciplinary by virtue of the organizations participating in NOGAP--seven federal departments and both territorial governments:

Federal Government

1) Indian and Northern Affairs Canada - Natural Resources and Economic Development;

2) Fisheries and Oceans - Pacific and Freshwater Fisheries, Science Sector;

3) Environment Canada - Conservation and Protection, Atmospheric Environment;

4) Agriculture Canada - Canadian Forestry Service;

5) Energy, Mines and Resources Canada - Geological Survey of Canada;

6) Transport Canada - Canadian Coast Guard Northern;

7) National Museums of Canada - Canadian Museum of Civilization, Archaeological Survey of Canada.

Government of Yukon

1) Executive Council Office - Bureau of Statistics;

2) Education - Yukon Archives;

3) Economic Development: Mines and Small Business;

4) Renewable Resources - Lands, Parks and Resources; Fish and Wildlife;

5) Tourism - Heritage Branch.

Government of the Northwest Territories

1) Culture and Communications - Prince of Wales Northern Heritage Centre;

2) Economic Development and Tourism;

3) Energy, Mines and Resources Secretariat;

4) Health - Programs and Standards;

5) Justice and Public Services - Legal, Consumer Services;

6) Municipal and Community Affairs - Policy and Legislation, Regional Operations;

7) Renewable Resources - Policy and Planning, Wildlife Management, Environmental Planning and Assessment;

8) Social Services - Regional Programs.

The bibliography contains all the reports produced completely or partially with NOGAP funding and submitted to the NOGAP Secretariat between July 1, 1986 and January 31, 1987. Some of these reports have been published, primarily in well-known departmental series. A majority of reports have not been formally published, although some may later be published in existing series. The reports are final, unless otherwise noted. Such documents as interim and annual progress reports for projects are not included, given their transitional nature.

Organization of the Bibliography

The bibliography is organized by NOGAP participant, in the order shown in the preceding section, and by the project name and number under which the material was developed.

The bibliography contains a full citation and an abstract for each report. The citation format is that used by the Arctic Science and Technology Information System (ASTIS). Abstracts were provided by the author(s), project manager or the NOGAP Secretariat, with the source noted (Au, managers' name or NOGAP).

Availability of Documents

The last line of the citations (i.e., the last line preceding the abstract) contains a location code indicating where the document may be obtained on interlibrary loan. The symbols for Canadian libraries assigned by the National Library of Canada are used. Most citations show the library symbol OORD, which indicates that such documents are available from:

Indian and Northern Affairs Canada
Departmental Library
Interlibrary Loan Section
Ottawa, Ontario
K1A 0H4

The library symbols used are as follows:

ACSP	Institute of Sedimentary and Petroleum Geology, Calgary
AEECW	Canadian Wildlife Service, Environment Canada, Edmonton
AEEPS	Environmental Protection Service, Northwest Region, Environment Canada, Edmonton
BVAEP	Environmental Protection Service, Pacific Region, Environment Canada, West Vancouver
BVAG	Geological Survey of Canada, Vancouver
MWFW	Freshwater Institute, Fisheries and Oceans, Winnipeg
NSDB	Bedford Institute of Oceanography, Dartmouth
NWYECW	Canadian Wildlife Service, Environment Canada, Yellowknife
NWYGI	Government In-Service Library, Government of the Northwest Territories, Yellowknife
NWYIN	Indian and Northern Affairs Canada, Yellowknife
NWYOS	Otto Schaeffer Health Resource Centre Library, Yellowknife
NWYRR	Renewable Resources Library, Government of the Northwest Territories, Yellowknife
NWYWNH	Prince of Wales Northern Heritage Centre, Government of the Northwest Territories, Yellowknife
OOFF	Environment Canada, Ottawa

OOG	Geological Survey of Canada, Ottawa
OJRD	Indian and Northern Affairs Canada, Ottawa
OTM	Atmospheric Environment Service, Environment Canada, Downsview, Ontario
YWA	Yukon Archives, Whitehorse
YWEEP	Environmental Protection Service, Environment Canada, Whitehorse
YWLS	Library Services Branch, Government of Yukon, Whitehorse

In some cases, individual copies of reports are available. A few citations contain this information. Further information on availability and source can be obtained from:

NOGAP Secretariat
Indian and Northern Affairs Canada
Ottawa, Ontario
K1A 0H4
(819) 994-6452

CITATIONS AND ABSTRACTS OF REPORTS

INDIAN AND NORTHERN AFFAIRS CANADA

GRANULAR RESOURCES INVENTORY AND MANAGEMENT PROGRAM (A.4)

Report on the analysis of bathymetric data : Western Beaufort (Yukon) continental shelf / Challenger Surveys & Services Ltd. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Edmonton, Alta. : Challenger Surveys & Services Ltd., 1986.
ii, 43 leaves : figures, tables, 28 cm.
Appendices.
References.
Pocket enclosure
OORD, NWYIN

A computer-based analysis of bathymetric data collected in the Western Canadian Beaufort Sea was undertaken to develop, test and implement a method of detecting subtle bathymetric anomalies and to provide a description of the regional bathymetry. Perspective mesh drawings of the sea floor were used as an improved method of depicting subtle bathymetric anomalies. Recommendations are included for undertaking future projects of this nature. (NOGAP)

Granular resource evaluation : Richards Island, N.W.T. / EBA Engineering Consultants Ltd. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Edmonton, Alta. : EBA Engineering Consultants Ltd., 1986.
iv, 32 p. : figures, tables ; 28 cm.
Appendices.
References.
OORD, NWYIN

A geotechnical evaluation of granular resource prospects on Richards Island was conducted during 1986 to re-evaluate and update information on the remaining resources on Crown lands in the northern Mackenzie Delta. The main objectives of the study were to locate additional supplies of, and to prepare development plans for sources determined to contain sufficient volumes of recoverable granular materials. The report includes summaries of the geological and geomorphic setting of Richards Island and of the field, laboratory and office procedures utilized in the evaluation. The results of the drilling program, laboratory testing and analysis are summarized in terms of overall material quality and quantity on a site-by-site basis. General recommendations for pit development and future work are provided. Detailed descriptions of site conditions, including borehole logs and laboratory test results, material qualities and quantities, and site-specific recommendations are presented in a separate appendix for each prospect investigated. (R. Gowan)

Overview of granular resources potential for the Western Beaufort (Yukon) continental shelf / Earth & Ocean Research Ltd. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Dartmouth, N.S. : Earth & Ocean Research Ltd., 1986.
iv, 78 leaves : figures, tables ; 28 cm.
Appendices.
References.
Pocket enclosures
OORD, NWYIN

This work is part of a program undertaken by Indian and Northern Affairs Canada to define systematically the sand and gravel deposits in the Beaufort Sea region. The study, conducted during February and March 1986, consisted of interpreting and integrating previously collected bathymetric, geophysical and geological data to provide an overview of the granular resource base. The area examined, about 5000 km^2, extends from the Yukon coast north to the shelf edge at approximately the 80 m contour, and westward from the eastern end of Herschel Island at approximately 139° W to the Yukon/Alaska boundary at 141° W. The proven, probable and prospective resources are defined in terms of location, areal extent, thickness, volume and quality. This overview will assist in planning future exploration studies to delineate granular materials for use in onshore or offshore construction by industry and government. (NOGAP)

OFFSHORE ENVIRONMENTAL ECOSYSTEMS MONITORING (A.7)

Beaufort environmental monitoring project 1984-1985 final report / ESL Environmental Sciences Limited. LGL Limited. ESSA Limited. Arctic Laboratories Limited. Arctic Sciences Limited. Canada. Dept. of Indian Affairs and Northern Development [Sponsor]. Canada. Environment Canada [Sponsor].
Ottawa : Dept. of Indian Affairs and Northern Development, 1986.
xxi, 162 p. : figures, tables ; 28 cm.
(Environmental Studies No. 39)
Appendices.
ISBN 0-662-15156-9
OORD, NWYIN

The Beaufort Environmental Monitoring Project (BEMP) was initiated in 1983 to provide the technical basis for the design, operation and evaluation of a comprehensive and defensible environmental research and monitoring program to accompany phased hydrocarbon development in the Beaufort Sea. This document is the report of activities during 1984/85. The primary activities were a pre-workshop review of studies initiated from December 1983; preparation of project overviews describing the purpose of these studies and their relationship to BEMP hypotheses; the workshop itself, and preparation of this report. The report contains a summary of the conclusions and recommendations from the workshop, a review of new information relevant to the various linkages that comprise the BEMP impact hypotheses, and the rationale for specific research or monitoring recommendations. (NOGAP)

Zooplankton of a bowhead whale feeding area off the Yukon coast in August 1985 / LGL Limited. Bradstreet, M.S.W. Arctic Sciences Ltd. Fissel, D.B. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
King City, Ont. : LGL Limited, 1986.
v, 155 p. : figures ; 28 cm.
Appendices.
References.
OCRD

The broad objective was to conduct field investigations on oceanographic conditions and the presence of planktonic food to understand better the significance of the study area in the bowhead whales' annual energy budget. Three tasks were undertaken and integrated: 1) physical oceanographic characterization of the study area; 2) determination of zooplankton biomasses in the study area; 3) assessment of the food value of zooplankton available to bowheads. The hydrographic regime occurring off the Yukon coast in late summer with prevailing easterly winds is conducive to the formation of zooplankton concentrations, which were found during this study. There is strong evidence that bowhead whales were feeding on these very small items. The results are consistent with the hypothesis that locations with high zooplankton biomass vary from year to year, probably depending on regional and local meteorological events. The results also suggest that dominant species in the zooplankton are also variable. However, to evaluate fully the hypothesis that bowhead distribution varies in response to changes in the distribution of their food, information is needed on zooplankton availability along the Yukon coast in years with prevailing westerly winds during late summer. (NOGAP)

DISTURBANCE OF MARINE MAMMALS BY INDUSTRIAL ACTIVITY (A.8)

Experimental use of aerial photogrammetry to assess the long term responses of bowhead whales to offshore industrial activities in the Canadian Beaufort Sea, 1984 / LGL Limited. Davis, R.A. Koski, W.R. Miller, G.W. Canada. Dept. of Indian and Affairs and Northern Development [Sponsor]. Canada. Dept. of Supply and Services [Sponsor].
King City, Ont. : LGL Limited, 1986.
xvi, 157 p., 3 p. of plates : figures, tables ; 28 cm.
Appendices.
References.
OCRD, NWYIN

This study tested a photogrammetric approach as a method to examine the effects of offshore industrial activities in the Canadian Beaufort Sea on bowhead whales. Vertical low-level aerial

photography was used. ... The study attempted to: 1) document daily and weekly movements of individually recognizable bowhead whales in relation to the presence or absence of industrial activities; 2) determine whether individual whales return in subsequent years to areas where they encountered industrial activities; 3) examine the relationship between a whale's length and its occurrence near industrial activities; 4) determine whether bowheads in the industrial area are representative of the Western Arctic population, and 5) increase the sample size of measured and individually recognizable whales. This study answered these questions to varying degrees because the rate of inter-day resightings of individually recognizable whales was low, few whales were present and photographed within the industrial area itself, and few between-year sightings were recorded. ... (Au)

Reactions of beluga whales and narwhals to ship traffic and ice-breaking along ice edges in the eastern Canadian high Arctic : 1982-1984 / LGL Limited. Canada. Dept. of Indian Affairs and Northern Development Canada [Sponsor].
Ottawa : Indian Affairs and Northern Development, 1986.
v, (various pagings) : figures, tables ; 28 cm.
(Environmental Studies No. 37)
References.
ISBN 0-662-14579-8
OORD, NWYIN

This report provides a general overview of a three-year study of the effects of ships and icebreaking on beluga whales and narwhals. This study was a response to specific concerns regarding proposals to send the MV ARCTIC through the ice in Admiralty Inlet and to a broader concern about the effects of Arctic shipping on marine mammals. Whale behaviour was monitored in three states: undisturbed; when the ships arrived and during periods of ship activity; and for short post-disturbance periods. The results clearly demonstrate that belugas and narwhals in the high Arctic are very sensitive to disturbance by shipping in the spring. However, the two species respond differently, in ways that reflect their overall survival strategies. These have been designated as a "flee" response in the beluga and a "freeze" response in the narwhal. The observable and audible behavioral traits associated with these patterns are described. (NOGAP)

Compilation of 1985 industrial activities in the Canadian Beaufort Sea / PN Research Projects. Norton, P. ESL Environmental Sciences Ltd. McDonald, J.W. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Sidney, B.C. : PN Research Projects, 1986.
iv, 50 p. : figures, tables, maps ; 28 cm.
Appendices.
References.
OORD, NWYIN

This document provides a compilation of 1985 industrial activities information for the Canadian Beaufort Sea. The methods used to compile, tabulate and organize the information are generally the same as those established in the 1983 compilation by the U.S. Minerals Management Service, with the following major exceptions: 1) the time frame was expanded to include June 1 to December 31, 1985; 2) available information on activities in "nearshore" areas was included; 3) summary tables plus maps are provided to indicate activity locations and intensity; 4) research flights were tabulated and mapped as separate activities. All of the data is available on 5.25" floppy diskettes for use on an IBM PC or compatible microcomputer using the dBase-III database management system. The diskettes are archived with Northern Environment Directorate, Indian and Northern Affairs Canada, Hull, Quebec. They include information on activity type, time period, specific vessel or aircraft used, and location of activity. (NOGAP)

Simultaneous counts of white whales using visual and photographic censusing techniques in the Beaufort Sea and Amundsen Gulf, July 1985 / PN Research Projects. Norton P. Dept. of Fisheries and Oceans, Western Region. Strong, J.T. Weaver, P.A. ESL Environmental Sciences Limited. Harwood, L.A. Electro-Magnetic Sensing and Interpretation. Barber, D.G. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Sidney, B.C. : PN Research Projects. ESL Ltd.
Winnipeg, Man.: DFO, Western Region. Electro-Magnetic Sensing and Interpretation, 1986.
16 p. : figures, tables ; 28 cm.
Appendix.
References.
OORD, NWYIN

During July 1985, concurrent aerial survey programs, one using visual and one using photographic censusing techniques, on white whales (Delphinapterus leucas) in the eastern Beaufort Sea and Amundsen Gulf provided an opportunity to compare these two techniques. ... To our knowledge, the present study is the first to compare simultaneous counts of cetaceans using aerial, visual and photographic techniques over a range of habitats and conditions. (Au)

HYDROCARBON ACTIVITIES: MARINE RESEARCH AND MANAGEMENT (A.20)

1982-1983 Beaufort Sea shorebase monitoring program; statistical analysis and recommendations for future programs / Dobrocky Seatech Ltd. Yunker, M.B. Canada. Department of Indian and Affairs and Northern Development [Sponsor].
Sidney, B.C. : Dobrocky Seatech Ltd., 1986.
xxii, 191 p. : figures, tables ; 28 cm.
(Final report)
Appendices.
References.
OORD, NWYIN

This report presents a statistical analysis of the 1982 and 1983 data reports produced for the Beaufort Sea Shorebase Monitoring Program. Recommendations are made regarding sampling and analytical considerations for the monitoring program as it is presently designed. The overall design of marine chemistry monitoring programs is also discussed as it applies to the Beaufort Sea Shorebase Monitoring Program requirements. Finally, requirements for quality assurance and quality control are discussed. (G. Stewart)

Beaufort Sea shorebase monitoring program a data report on 1984 geochemical sampling / Nuclear Activation Services Limited. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Hamilton, Ont. : Nuclear Activation Services Limited, 1986.
122 p. : figures, tables ; 28 cm.
Appendices.
References.
OORD, NWYIN

This data report is part of the joint government - industry Beaufort Sea shorebase monitoring program that is designed to monitor the marine environment along the Tuktoyaktuk Peninsula for potential impacts from oil industry activities. In the summer of 1984 sediment samples from 22 sampling stations along the Tuktoyaktuk Peninsula were collected. The sediment samples consisted or core and grab samples from 15 stations located in Tuktoyaktuk Harbour, 4 stations in McKinley Bay and 3 in Hutchison Bay. The results of the geochemical analysis of these samples for hydrocarbons, heavy metals, major elements, total organic carbon and sediment particle size are presented. (Au)

Long term potential for leaching of oil contaminated cuttings from the use of oil based muds in the Arctic marine environment / Dobrocky Seatech Ltd. Yunker, M.B. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Sidney, B.C. : Dobrocky Seatech Ltd., 1986.
xviii, 89 p. : figures, tables ; 28 cm.
(Final report)
Appendices.
References.
OORD, NWYIN

This report describes the experimental investigation of the rates and durations of release of oil and oil fractions from low aromatic mineral oil contaminated drill cuttings discharged to static (under ice) and dynamic (open water, wave) arctic marine environments. Experimental and analytical protocols are described and results are presented. The rates of hardening and consolidation (cuttings pavement formation) of the cuttings layers under static and dynamic conditions were also investigated. The wave regime was found to be the dominant influence in the experiments conducted; the oil concentrations on the cuttings were significantly affected by the presence of waves. (G. Stewart)

Incineration of oil based drilling muds / Dome Petroleum Limited. Canada. Dept. of Indian Affairs and Northern Development [Sponsor].
Calgary, Alta. : Dome Petroleum Limited, 1986.
ii, 85 p., plates ; figures ; 28 cm.
Appendices.
References.
OORD, NWYIN

This project investigated the usefulness of four oil spill incinerators for the disposal of oil based drilling muds. Three oil based muds (fresh diesel, fresh mineral and used diesel) were incinerated using the Air-Portable Incinerator, the Reciprocating Kilo, the Saacke Waste Oil Burner and the T.O.P.S. (Technical Offshore Petroleum Service) Burner. The efficiency of burn and quality of the resulting residue were evaluated for each device. It was found that all three muds could be burned with equal efficiency within each of the four incinerators. ... Two burners proved to be particularly effective for burning oil based muds. The T.O.P.S. burner incinerated all muds at high rates of combustion (average 331 bbls/day). The Saacke burner also provided significant incineration capability (average 166 bbls/day), although this unit would require modification to handle the solids content on a continuous basis. ... (Au)

ONSHORE ENVIRONMENTAL MONITORING AND RESEARCH PROGRAM (A.21)

Mackenzie environmental monitoring project 1985/86 final report / LGL Limited. ESL Environmental Sciences Limited. ESSA Environmental and Social Systems Analysts Limited. P.J. Usher Consulting Services Limited. Canada. Dept. of Indian Affairs and Northern Development [Sponsor]. Canada. Environment Canada [Sponsor]. Government of the Northwest Territories [Sponsor]. Government of the Yukon [Sponsor].
[S.l. : s.n.], 1986.
xxviii, 308 p. ; 28 cm.
Appendices.
OORD, NWYIN

This report summarizes the results of the first year of the Mackenzie Environmental Monitoring Program (MEMP). The objective of MEMP is to recommend a monitoring and research program that will both address significant potential impacts, based on current understanding of industrial development scenarios and ecological processes, and also have the capability to respond to changing industrial development scenarios and new information regarding ecological processes in the region. The recommended program must be applicable and practical, and be supported with full scientific and technical justification. This first report describes possible effects of developmental uncertainties in regard to predictive capability, recommended

research plans and rationale for the recommended studies. Since the nature of the recommendations have been heavily influenced by the methods, a description of the methods used throughout the program is included. Through workshops and technical meetings involving northern residents, government scientists and industry representatives and consultants, 25 impact hypotheses were developed. Conclusions and recommendations are provided for each hypothesis. (F. McFarland)

FISHERIES AND OCEANS

EFFECTS OF VESSEL NOISE AND TRAFFIC ON ARCTIC MARINE MAMMALS (B.1)

White whale use of the southeastern Beaufort Sea, July - September 1984 / Norton, P. Harwood, L.A. Canada. Dept. of Fisheries and Oceans [Sponsor].
Winnipeg, Man. : Dept. of Fisheries and Oceans. Western Region, 1985.
v, 46 p. : figures, tables ; 28 cm.
(Canadian technical report of fisheries and aquatic sciences 1401)
(188th technical report, Western Region)
Appendices.
References.
Supply and Services Canada Cat. No. Fs 97-6/1401E
ISSN 0706-6457
OORD, MWFW

This report presents data collected on white whales (Delphinapterus leucas) during six systematic aerial surveys of the southeastern Beaufort Sea during July, August and September, 1984. The first survey coincided with the period when white whales concentrated in the Mackenzie Estuary, yet 40.8 white whales/1 000 km^2 were observed offshore. White whale abundance in the offshore Beaufort generally increased from early July through to the third week of July (99.7/ 1 000 km^2), and then declined. Cow-neonate pairs were frequently recorded offshore. White whales may have started moving into Alaskan waters as early as mid-July, although the results suggest that most migrated from the region between late July and mid-September. The July 21-23 survey results were used to calculate a minimum estimate of 7 081 animals in the study area; this estimate does not include whales in Amundsen Gulf, and has not been corrected for unseen animals or for reduced detectability of white whales in outer portions of the transect strip. Calving and feeding may occur offshore. (Au)

CRITICAL ESTUARINE AND MARINE HABITATS OF THE CANADIAN ARCTIC COASTAL SHELF (B.2)

Taxonomic key to larval fish species which occur in the shelf waters and estuaries of the Canadian Beaufort Sea / North/South Consultants Inc. Konrad, S.-L.R. Canada. Dept. of Fisheries and Oceans [Sponsor].
Winnipeg, Man. : North/South Consultants Inc., 1985.
v, 128 p. : tables ; 28 cm.
(NOGAP report, no. B.2-6)
Appendices.
References.
Working draft report
OCRD, MWFW

The species of larval fish occurring within the Canadian Beaufort Sea shelf and its estuaries have been systematically addressed. A precis of larval fish development and identification techniques are presented for the technician and research staff confronted with identifying larval fish. Some problems and recommendations in larval fish taxonomy are presented. A key to 12 families has been constructed, strictly based on species occurring in this region. A key to species is also provided for 8 of the 12 families and 30 of the 53 possible species. These keys are an attempt to summarize the present taxonomic knowledge on larval fish in this area and to accelerate and simplify specimen identification. Species descriptions, based on available information, follow each key, along with a list of useful references which comprises the bibliography. Illustrations, if available, follow each species description. (Au)

Aspects of the biology of arctic cod (boreogadus saida) and its importance in arctic marine food chains / Bradstreet, M.S.W. Finley, K.J. Sekerak, A.D. Griffiths, W.B. Evans, C.R. Fabijan, M.F. Stallard, H.E. Canada. Dept. of Fisheries and Oceans [Sponsor].
Winnipeg, Man. : Dept. of Fisheries and Oceans, 1986.
viii, 193 p. : figures, tables ; 28 cm.
(Canadian technical report of fisheries and aquatic sciences 1491)
(4th technical report, Central and Arctic Region)
(NOGAP report, no. B.2-10)
Appendices.
References.
Supply and Services Canada Cat. No. Fs 97-6/1491E
ISSN 0706-6457
OCRD, MWFW

Arctic cod occur throughout the marine waters of northern North America, as far north as 88°N. Young-of-the-year (Y-O-Y) Arctic cod are planktonic. ... The diet of 708 Y-O-Y Arctic cod from six locations across northern Canada was investigated. ... We investigated measurement techniques for cod otoliths and found that length measurements through the centrum and parallel to the otolith's sides gave the least observer error. ... Otoliths are better than

scales for ageing. ... The age-frequency distributions of cod otoliths in predator samples (stomachs, feces) and in a few fish collections were compared. ... Growth of Arctic cod was investigated. ... There are significant differences in the growth of cod collected in different places and times, and measurements of annular growth increments in Arctic cod otoliths seem to offer a better potential for detecting growth differences than do calculations of Ford's growth co-efficients. Estimates of the mortality rates of Arctic cod were developed from the numbers of otoliths of different ages in different predators. ... The distributions and diets of three migratory marine mammals occurring in the eastern Canadian Arctic (harp seal, narwhal and white whale) indicated that Arctic cod undergo a major inshore movement during the late summer. In some areas this phenomenon occurs yearly, in others irregularly. ... predators are excellent sampling agents for Arctic cod. ... (Au)

Identification and characterization of arctic nearshore benthic habitats / LGL Limited. Thomson, D.H. Martin, C.M. Cross, W.E. Canada. Dept. of Fisheries and Oceans [Sponsor].
King City, Ont. : LGL Limited, 1986.
vii, 70 p. : figures, tables ; 28 cm.
(Canadian technical report of fisheries and aquatic sciences 1434)
(192nd technical report, Western Region)
(NOGAP report, no. B.2-18)
Appendices.
References.
Supply and Services Canada Cat. No. Fs 97-6/1434E
ISSN 0706-6457
OORD, MWFW

Infaunal samples (n = 460) from depths of 1-55 m at 25 sites in the eastern and central Canadian Arctic islands were analyzed. Nine infaunal species assemblages defined by factor analysis were, for the most part, not restricted in their geographical distribution but did show evidence of depth and substrate preferences. ... Depth, substrate, exposure, mortality and food supply appeared to be major determinants of standing crop and community structure. The upper 3-5 m was usually depauperate of infauna due to variations in temperature and salinity and presence of ice. The barren zone extended to deeper depths in exposed locations, as did the depth of maximum standing crop. The productivity to biomass ratio of bivalves was only about 0.1-0.2 but total productivity was moderately high. Predation on the infauna appears to be at a constant low level and mortality of the infauna is low. ... Rock substrates were characterized by chitons, gastropods and sessile epifaunal forms such as barnacles, mussels, anemones, tunicates, sponges and hydrozoans. Biomass on rock surfaces often was high and comparable to that of the infauna. Sea urchins were common in all areas with seaweed and their biomass may also be high. Quantitative intertidal samples (n = 234) from 16 locations in the central and eastern Canadian Arctic islands were analyzed. ... (Au)

Description of arctic nearshore meiobenthos from oiled and unoiled sediments at Cape Hatt, Northern Baffin Island / Martin C.M. Cross, W.E. Canada. Dept.of Fisheries and Oceans [Sponsor].
Winnipeg, Man. : Dept. of Fisheries and Oceans, 1986.
iv, 24 p. : figures, tables ; 28 cm.
(Canadian technical report of fisheries and aquatic sciences 1468)
(199th technical report, Western Region)
(NOGAP report no. B.2-19)
References.
Supply and Services Canada Cat. No. Fs 97-6/1468E
OORD, MWFW

Benthic meiofauna from shallow nearshore waters at Cape Hatt, northern Baffin Island, were dominated by nematodes (68.4% of individuals collected, foraminiferans (10.1%), and copepods (7.7%). Densities were high...relative to most other Arctic and boreal locations studied. Analyses of variance revealed several types of systematic variability in the densities of dominant meiofaunal groups: variability among depths, bays, and years. Possible effects of oil released during the Baffin Island Oil Spill (BIOS) project in 1981 were indicated in a posteriori comparisons between reference bays and one bay where sediment oil concentrations were elevated. ... Each of these differences was consistent with differences in measured (or presumed) oil concentrations among depths, bays, and years. However, the lack of pre-spill data and replicated oil treatments precludes unequivocal conclusions; factors other than oil (e.g. substrate or exposure) may have been responsible for the observed patterns of distribution. ... (Au)

ENVIRONMENT CANADA

NORTHERN MARINE PIPELINE CONTROL TECHNOLOGY (C.1)

Northern marine pipeline control technology / Monenco Consultants Limited.
Calgary, Alta. : Monenco Consultants Limited, 1986.
iii, (various leaves) : figures, tables ; 28 cm.
References.
OORD, YWEEP, AEEPS, OOFF

The objective of this report is to describe current marine pipeline technology as it relates to the Arctic environment, and to discuss the environmental and technical implications and information gaps of marine pipeline construction and operations. The report describes the state-of-the-art of Arctic marine pipeline construction and identifies the unique aspects of the construction and operation of a pipeline in the Arctic environment. In particular, the ever-present ice conditions, the relatively short open water season and the need to protect the pipeline from scour by various types of ice features have been identified. Various parameters which characterize the

environmental implications of pipeline failure or release of pipeline contents are described. A pipeline fluid release of known quantity and chemical characteristics at a defined Arctic location, combined with the environmental implications, will allow environmental assessment of oil spills or other pipeline fluid releases. (E. Collins)

BEHAVIOUR OF OIL IN ICY WATERS (C. 6-1)

Behaviour of oil in freezing situations / Department of Chemical Engineering and Applied Chemistry, University of Toronto. Wilson, D.G. Mackay, D. Canada. Environment Canada [Sponsor].
Toronto, Ont. : University of Toronto, 1986.
iv, 63 p. : figures, tables ; 28 cm.
(C&P manuscript series)
References.
OORD

An experimental study of the behaviour of an oil spill in a developing (grease) ice field is described. It was found that significant quantities of oil may be entrained within and beneath a grease ice field. ... It is suggested that the results and observations obtained here be used as a component in an "expert system" computer model that would aid in the prediction of the fate and behaviour of an oil spill in the presence of a developing ice field and in other regimes in which oil may interact with ice. This model may then be included as part of a comprehensive model encompassing the entire spectrum of oil spill conditions which may occur in the Arctic marine environment. (Au)

MIGRATORY BIRD DISTURBANCE, ASSESSMENT AND MANAGEMENT (C.7)

Beaufort Sea coastal bird surveys 1985 season / Canadian Wildlife Service. Alexander, S.A.
Edmonton, Alta. : Canadian Wildlife Service, 1986.
viii, 80 p. : figures, tables ; 28 cm.
Appendices.
References.
[illegible]D, AEECW, NWYECW, YWLS

Three surveys were flown along the coast of the Beaufort Sea from Komakuk Beach, Yukon Territory to the Baillie Islands, Northwest Territories in late July, mid-August and early September 1985 to locate broodrearing, moulting and migrating birds. Results were compared to similar flights flown in 1980 and 1981, and coastal regions important to birds were identified, based on the results of all three years of surveys. ... (Au)

BEAUFORT SEA STATE FORECAST MODEL (C.16)

Forecasting Beaufort Sea wind waves by a momentum balance method / MacLaren Plansearch Limited. Canada. Atmospheric Environment Service [Sponsor].
Halifax, N.S. : MacLaren Plansearch Limited, 1986.
1 v. (various leaves), : figures, tables ; 28 cm.
Appendices.
References.
OORD, OTM

The study developed, tested and evaluated a "practical" wave forecast procedure for the Beaufort Sea, based on an existing Atmospheric Environment Service lake wave model. The particular model utilized in this study is a deep water parametric model based on a momentum balance procedure developed in the late 1970s by Dr. Mark Donelan of the Canadian Centre for Inland Waters. The study consisted of four mutually dependent tasks: 1) conversion of the AES lake wave model to a Beaufort Sea wave model, including documentation of the software; 2) assembly of a data base consisting of relevant environmental data (i.e., winds, waves, ice, bathymetry, etc.); 3) model runs and case studies for a pre-selected study period; 4) comparison of model results against observed data. The model used in this study is an Eulerian parametric wave forecast model, which differs from other parametric models in a number of ways. The general conclusion reached is similar to that stated in a number of previous model applications for the Great Lakes; i.e., the model has considerable potential for use as an operational wave forecaster for the Beaufort Sea but a significant amount of work still needs to be done, particularly in the areas of modeling marginal ice conditions and obtaining accurate input winds. (NOGAP)

Forecasting Beaufort Sea wind waves by a momentum balance method : supplementary data base report / MacLaren Plansearch Limited. Canada. Atmospheric Environment Service [Sponsor].
Halifax, N.S. : MacLaren Plansearch Limited, 1986.
1 v. (various leaves) : maps ; 28 cm.
OORD, OTM

This report documents the data base assembled and/or identified as part of the title study. Although the study is confined to the period July 25 to October 5, 1981, data for the years 1982, 1983 and 1984 has been identified to facilitate future testing and evaluation of models for the Beaufort Sea area. The primary source of obtaining wind, bathymetry and observed (wind and wave) data was from the AES archived data files for the years 1981 to 1984. The report documents all of the raw data collected and describes to some extent the results of the preprocessing done in order to utilize the data for the study. The files described in this report are: 1) wind data - CMC winds for 1981 study period and 1981-1984, and observed winds for

1981 study period; 2) bathymetry and shoreline data - fine and coarse grid, and model grid; 3) ice boundary data - composite charts for 1981 study period and 1981-1983, and maximum, median and minimum; 4) observed wind and wave data - MAST 1980-1983, DOME observations for 1976-1982 and MEDS waverider data for 1981-1982. (NOGAP)

BEAUFORT WIND CLIMATOLOGIES (C.18)

Evaluation of existing climatologies for the Beaufort Sea / The MEP Company. Canada. Atmospheric Environment Service [Sponsor].
Downsview, Ont. : Atmospheric Environment Service, 1986.
v, 88 p. : tables ; 28 cm.
(Canadian Climate Centre report, no. 86-13)
Appendices.
References.
Final report
OORD, OTM

Over the past 10 to 15 years a variety of climate studies have been done for the Beaufort Sea area by both industry and government. This report provides a review of as many of these studies as possible to document the current extent of knowledge, identify and assess any limitations of previous studies, and identify priorities for future research. The report is addressed in particular to the needs of the oil and gas industry. (Au)

Assessment of Canadian Arctic wind data sets / Environmental Climate Services. Olson, R. Canada. Environment Canada, Atmospheric Environment Service [Sponsor].
Downsview, Ont. : Atmospheric Environment Service, 1986.
vii, 58 p. : figures, tables ; 28 cm.
(Canadian Climate Centre report, no. 86-9)
Appendices.
References.
OORD, OTM

A knowledge of oceanic wind fields is a principal requirement for many meteorological and oceanographic applications. In Arctic Canada coastal and offshore Ships-of-Opportunity wind data are sparse and generally have short durations. As an attempt to fill the data gap, hindcast computer winds have been generated using readily available synoptic atmospheric pressure gradients. The purpose of this study is to provide an analysis of the quality of these computer generated and Ships-of-Opportunity winds. These data have been compared relative to both Atmospheric Environment Service coastal stations and geostrophic winds that were extracted from the pressure fields of synoptic weather maps. There are large variations in the wind field between some data sets but, between others, the differences are not significant. Not only does this occur within subregions but also between adjacent sites. Thus, none of the data sets are adequate for all applications. Caution must be exercised when choosing a data set for a particular application for a certain area. (Au)

ENERGY, MINES AND RESOURCES CANADA

COASTAL ZONE GEOTECHNICS, BEAUFORT SEA (D.1)

King Point coastal zone sediment transport study (contractor's report on field operations) / Dobrocky Seatech Ltd. Gillie, R.D. Canada. Geological Survey of Canada [Sponsor].
Sidney, B.C. : Dobrocky Seatech Ltd., 1985.
viii, 29 leaves, [105] p.: figures, tables; 28 cm.
(Geological Survey of Canada open file report, no. 1260)
Copies available from Maritime Resource Management Services, P.O. Box 310, Amherst, N.S., B4H 3Z5, $29.15.
Appendices.
References.
OOG, NSDB, BVAG

This study was conducted at King Point on the Yukon coast of the Beaufort Sea from 24 August to 16 September, 1985 for the King Point Coastal Zone Sediment Transport Study. King Point has been proposed as a site for a port in connection with Beaufort hydrocarbon development. Information on the wind and wave climate, coastal geology, and rates and directions of sediment transport is required. The data collected in this study is being used to provide input to coastal sediment transport model predictions for the King Point area. The report contains a brief description of the study area and the design of the field experiment, followed by a detailed account of the instrumentation and techniques used, and an inventory of the data collected. Finally, a brief discussion of the field program makes suggestions for alterations or improvements to the techniques used. (NOGAP)

Interpretation of Beaufort Sea 1985 high resolution refraction/ reflection data / Fortin, G. Canada. Geological Survey of Canada [Sponsor].
Hull, P.Q.: Guy Fortin, 1986.
i, 53 leaves, [5] leaves of plates : figures ; 28 cm.
(Geological Survey of Canada open file report, no. 1350)
References.
Pocket enclosure
OOG

A combined high resolution seismic refraction/reflection survey was carried out during September 1985 by the Terrain Geophysics Group of the Geological Survey of Canada to test a deep towed, 12-channel marine eel in the Canadian Beaufort Sea. The primary objective was the detection of sub-bottom ice-bearing permafrost within about 20 m of the seabottom, as an aid in pipeline routing and wellsite evaluation. The study also provided velocity measurements of unfrozen seabed sediments, which may be useful in the search for granular deposits. The report describes the seismic compressional wave velocities and the geologic features encountered in the immediate

sub-bottom along a number of regional lines. These lines were traversed north of Pullen Island on the Akpak Plateau and across the Kugmallit Channel, where future pipeline routes might be located. The lines comprise six profiles with 792 velocity observations along about 110 km of seismic data. These profiles pass through Isserk E-27, Arnak L-30 and Kugmallit H-59 wellsites. Vertical incidence single channel reflection records were collected along five lines. (NOGAP)

Sediment transport study at King Point, Yukon Territory / Atlantic Geoscience Centre. Morgan, P.
(Current Research - Geological Survey of Canada, part B. paper 86-1B, p. 859-863, 1986, figures)
References.
OOG, NSDB

A field study was conducted at King Point to collect sediment transport and coastal zone data. Nearshore directional wave measurements were collected for the first time in the Canadian Beaufort Sea. The data also included wind speed and direction, bottom current velocities and directions, sediment samples, and beach and bathymetric profiles. The data will be used to calibrate numerical models to estimate wave climate and alongshore sediment transport rates and directions. (Au)

ARCTIC ISLAND CHANNEL GEOTECHNICS (D.2)

Geological data compilation for marine areas of the Canadian Arctic Archipelago / M.J. O'Connor & Associates Ltd. Geological Survey of Canada [Sponsor].
[S.l] : M.J. O'Connor & Associates Ltd., 1984.
21 p., (various leaves) : figures, maps, tables; 28 cm.
(Geological Survey of Canada open file report, no. 1159)
Copies available from Precision Microfilming Services Ltd., Halifax at users expense.
Appendices.
References.
OOG, NSDB, ACSP, BVAG

This open file comprises a comprehensive compilation of geological data sources developed over the period 1943-1984 pertaining to the Canadian Arctic Archipelago. The majority of the information assembled was related to the geological, geophysical and geotechnical properties of the unconsolidated sediments and shallow bedrock materials underlying and immediately adjacent to the marine areas. The open file comprises an annotated bibliography and 31 CHS charts showing boundaries of marine related studies, sample locations and track plots of government and industry surveys. (B. MacLean)

Geological and cruise report on the bottom sampling program and operation of CSL TUDLIK on the CSS BAFFIN hydrographic cruise 84-015, Jones Sound, District of Franklin, N.W.T., Canada August-September 1984 / Geomarine Associates Limited. Ruffman, A. Geological Survey of Canada [Sponsor]
Halifax, N.S.: Geomarine Associates Limited, 1985.
vi, 87 leaves, : photos, figures, tables ; 28 cm.
(Geological Survey of Canada open file report, no. 1261)
Copies available from Precision Microfilming, Halifax, $39.00.
Appendices.
References.
Pocket enclosures
OOG, NSDB

The Arctic Pilot Project prompted the Canadian Hydrographic Service to initiate a two-year, multidisciplinary study of the bathymetry, geology and geophysics of Jones Sound in 1983. For its second year, the Atlantic Geoscience Centre decided not to attempt a full multidisciplinary geophysical survey, given the problems encountered with ice, logistics and ship time in 1983. Instead, it equipped the Canadian Survey Launch (CSL) TUDLIK for shallower water, nearshore work. The prime areas investigated were those on the shelf and slope around the margins of Jones Sound, shoreward of the areas mapped in 1983 to establish continuity with the previously-mapped offshore areas, wherever possible. The work done included a compilation on chart scale of interpreted seabed sediment type, sediment boundaries and relevant seabed data. (NOGAP)

Geochemical and mineralogical studies in the Arctic Archipelago / Centre for Cold Ocean Resources Engineering, Memorial University of Newfoundland. Macko, S.J. Segall, M.P. Pereira, C.P.G.
St. John's, Nfld. : C-CORE, University of Newfoundland, 1985.
v, 19 leaves : figures, tables ; 28 cm.
(Geological Survey of Canada open file report, no. 1315)
Copies available from Precision Microfilming, Halifax, N.S., $10.80.
Appendices.
References.
OOG, NSDB

The Byam Martin Channel region of the Canadian Arctic Archipelago has a clay mineral suite typical of northern, high latitude sediments, with chlorite and illite dominating the clay-sized fraction. Montmorillonite is prevalent (42-62%) in the nearshore areas of the Sabine Peninsula, Melville Island and Lougheed Island. The decrease of montmorillonite in sediments with distance from shore and from north to south in the study area is probably a result of differential flocculation and settling in the marine environment, and may be useful in determining local current patterns within the study area. Stable carbon and nitrogen isotopic analyses indicate three independent sources of organic material. Major localized inputs of ^{15}N rich organics mix with cold water marine and terrigenous end members. (Au)

Marine geological program in the Byam Martin Channel - Lougheed Island region, District of Franklin / Atlantic Geoscience Centre. MacLean, B. Vilks, G.
(Current Research - Geological Survey of Canada, part A. paper 86-1A, p. 769-774, 1986, figures, table)
References.
OOG, NSDB

A seabed sediment sampling program was carried out through the ice in the Byam Martin Channel - Cameron Island - Lougheed Island region of the Canadian Arctic Archipelago in April and May 1985. Sampling operations were carried out at 79 stations over a 23 200 km^2 area mainly with a 27 kg gravity corer. Maximum core recovery was approximately 1 m. Grab samples were obtained at 19 stations with a Dietz-Lafonde sampler. Preliminary results indicate that the upper metre of seabottom sediments consists predominantly of silt or clay with variable amounts of coarser material. Foraminifera in the surface sediments indicate a distinct faunal break at 200 m water depth which is related to water mass characteristics. (Au)

TRANSPORT CANADA

STUDIES TO ASSESS AND DEVELOP ARCTIC NAVIGATION SYSTEMS (E.5)

St. Lawrence River passive microwave experiments : winter 1985 / Norland Science and Engineering Ltd. Cameron, M. Bjerkelund, C. Lapp, D.
Ottawa : Environment Canada, Atmospheric Environment Service, 1985.
2 v. (xi, 144; various pagings) : figures, tables, plates ; 28 cm.
Appendices.
References.
OORD

... In preparation for the verification of an airborne passive microwave system with an imaging capability having a much higher resolution than satellite-based systems within the Atmospheric Environment Service (AES), the first of a series of ice research experiments was initiated in 1981 at Grindstone Island, New York...to obtain a better understanding of freshwater ice passive microwave signatures. Variations of the project were repeated each winter, except for 1983, wherein truthing activities were conducted to correlate SLAR imagery with the ice surface features. This report presents the results of the 1985 experiment conducted between January and March. A 37 GHz passive microwave radiometer was erected on a dock platform overlooking the newly forming ice in December 1984. Data acquisition commenced in mid-January, with three additional data sets collected over February and early March. The data sets consisted of brightness temperature measurements as a function of angle between

0° (nadir) and 90° at a select set of azimuth angles. ... The objectives of the program were revised as follows: 1) to determine the effect of snow cover on microwave signatures as a function of air temperature, snow wetness and snow grain size, if practical, and 2) to determine the effect of open water on passive microwave signatures at various incidence angles. (Au)

CANADIAN MUSEUM OF CIVILIZATION

NORTHERN HYDROCARBON ARCHAEOLOGY: A COORDINATED ATTEMPT AT DEVELOPING AN INTEGRATED RESOURCE MANAGEMENT SYSTEM WITHIN THE NOGAP AREA (F.1)

Copies of all reports issued under this project are available from: Curator of Scientific Records, Archaeological Survey of Canada, Canadian Museum of Civilization, Ottawa, Ontario K1A 0M8.

Report of field activities - NOGAP 1985: Northern Yukon-Western Mackenzie Delta / Archaeological Survey of Canada, National Museum of Man, Le Blanc, R.J.
Ottawa : Archaeological Survey of Canada, National Museum of Man, 1986.
vi, 77 leaves, [31] plates : figures, tables ; 28 cm.
Appendix.
References.
OORD

The 1985 field season of NOGAP archaeological work included inventory of the eastern half of the Yukon coastal plain and parts of the eastern flank of the Richardson Mountains, and test excavations at a previously located site on the Trail River (NgVh-1) at the western limit of the study area. Twenty-four sites were found along river valleys, on the Beaufort Sea coast, and on upland knolls and ridges of the North Slope. Test excavations at NgVh-1 yielded an assemblage characterized by technological debris associated with the production of antler tools. The site also had tent rings, house and shooting blind depressions, and a rock alignment used as a caribou drive. These features suggest that the site was a seasonal caribou hunting complex, used to exploit the Porcupine caribou herd. (Au)

Mackenzie Valley archaeological survey field report / Archaeological Survey of Canada, National Museum of Man. Pilon, J.L.
Ottawa : Archaeological Survey of Canada, National Museum of Man, 1985.
43 leaves, [8] plates : figures ; 28 cm.
Appendix.
References.
OORD

The first field season of the Archaeological Survey of Canada, Canadian Museum of Civilization NOGAP project in the southwest Anderson Plain took place in 1985. Seventy-eight localities were inspected, of which forty had evidence of either prehistoric (18) or historic (11) occupations, or both (4). Seven could not be firmly attributed to either period. Most of the prehistoric components are characterized by thin scatters of faunal remains and lithic debitage as well as occasional hearths and fire-cracked rocks. They appear to relate to the late prehistoric period, although the nature of the samples makes this statement highly tenuous. (Au)

Northern Oil and Gas Action Plan assessment of the Lancaster Sound Region: an archaeological survey of the southeast coast of Devon Island from Wellington Channel to Stratton Inlet, August 3-12, 1985 / Northlands Research. Sutherland, P.D. Canada. Archaeological Survey of Canada, National Museums of Canada [Sponsor].
(S.l.) : Northlands Research, 1986.
88 leaves, [32] plates : figures, tables ; 28 cm.
Appendices.
References.
OORD

During the summer of 1985, the contractor undertook both helicopter and ground surveys for archaeological sites in the area under consideration. The work, which also included test excavations at one specific locality at the entrance to Maxwell Bay, was carried out in order to increase the archaeological database along one segment of the Northwest Passage and, in so doing, to provide the archaeological component of NOGAP with a better appreciation of the area's archaeological research and management requirements. Following a presentation of the study area and an archaeological overview, the report deals with the details of both field and laboratory work, and with the description and evaluation of identified sites and collections. In conclusion, it offers a number of recommendations relative to archaeological resource management in the Lancaster Sound region. (J. Cinq-Mars)

Report on Kugaluk site excavations, 1985 / Archaeological Survey of Canada, National Museum of Man. Morrison, D.A.
Ottawa : National Museums of Canada, 1985.
i, 12 leaves, [3] plates : figures ; 28 cm.
References.
OORD

Excavations were undertaken in 1985 at Kugaluk, an early historic Mackenzie Inuit site located in Kugaluk Inlet, in the northwestern Northwest Territories. A number of activity areas and structures were mapped and tested, and both faunal and artifact collections were made. The site appears to be an important one from a number of research perspectives, and further work is strongly recommended. Kugaluk is in immediate danger of destruction due to land recession and erosion. (Au)

Report of field activities - NOGAP 1986: Northern Yukon to Cape Bathurst Peninsula / Archaeological Survey of Canada, Canadian Museum of Civilization. Le Blanc, R.J.
Ottawa : Archaeological Survey of Canada, Canadian Museum of Civilization, 1987.
120 leaves, 50 plates : figures, tables ; 28 cm.
References.
OCRD

In 1986, the Archaeological Survey of Canada continued the NOGAP archaeological programme in the Beaufort Sea region which it had begun the previous year. Inventories were conducted along the Yukon Coastal Plain, Richards Island, the Tuktoyaktuk Peninsula, Liverpool Bay-Eskimo Lakes, the lower Anderson River, and the area around Harrowby Bay on the Bathurst Peninsula. Test excavations were also continued at a site (NgVh-1) on the Trail River. The Yukon inventory resulted in the discovery of 16 sites, some of which indicate intensive caribou hunting in the upper Trail and Tuluqaq rivers. In the Northwest Territories, the wide-ranging surveys added 51 new sites to the existing database and six others were revisited. The most archaeologically productive areas were the Tuktoyaktuk Peninsula between Tuktoyaktuk and McKinley Bay, and the mouth of the Anderson River. (Au)

Reconnaissance archéologique dans le sud-ouest de la plaine d'Anderson et dans la vallée du fleuve Mackenzie - rapport de terrain (PIPGN) / Commission archéologique du Canada, Musée canadien de civilisation. Pilon, J.-L.
Ottawa, Ont. : Commission archéologique du Canada, Musée canadien de civilisation, 1987.
106 feuilles : photos, figures, tables ; 28 cm.
Réferences.
OCRD

En cette deuxième saison d'activités du projet archéologique PIPGN, de la Commission archéologique du Canada, Musée canadien des civilisations, 5 sites trouvés en 1985 ont été revisités afin d'y recueillir des données additionnelles et 18 nouveaux sites archéologiques ont été découverts dans le sud-ouest de la plaine d'Anderson. Sur quatre des sites réexaminés, nous avons trouvé des maisons semi-souterraines. Deux autres habitations de ce genre ont été découvertes sur un des nouveaux sites. Les autres consistent en des restes fauniques, du débitage lithique et des traces de combustion. Nos observations suggèrent qu'elles remontent à la période préhistorique tardive. L'étude des données ayant trait a cette période pourrait bientôt permettre une synthèse préliminaire des schèmes d'exploitation de la région. (Au)

The second season of fieldwork in the southwest Anderson Plain portion of the Archaeological Survey of Canada, Canadian Museum of Civilization NOGAP project took place in 1986. Five previously known sites were revisited in order to collect additional information and 18 new sites were found. Semi-subterranean house pits were discovered on 4 of the revisited sites. Two other house pits were discovered on one of the newly discovered sites. The finds of most of the new sites consist of thin scatters of faunal remains and lithic debitage, and occasionally evidence of combustion activities. Most of these sites appear to relate to the late prehistoric period. The data which are now available for this time period should soon permit a preliminary synthesis of the exploitation patterns of this area. (Au)

Pilot study for assessment of landscape archaeological potential in NOGAP area / Terrain Analysis and Mapping Services Ltd. Rampton, V.N. Canada. Archaeological Survey of Canada [Sponsor].
Ottawa, Ont. : Terrain Analysis and Mapping Services Ltd., 1986.
39 leaves : tables, maps ; 28 cm.
References.
OORD

A pilot study was undertaken during the summer of 1986 to develop an efficient means of mapping and predicting the archaeological potential of landscape within the NOGAP area. The three areas selected for study included: 1) parts of the Yukon Coastal Plain, 2) southern Richards Island, and 3) Harrowby Bay. A classification system was developed using a range of variables to assign rankings to terrain units established on the basis of previous quaternary mapping. Preliminary infield evaluation of the programme indicates potential for improved site discovery, but more intensive field investigations will be required to more fully assess its potential. (R.J. Le Blanc)

Report on Kugaluk site excavations, 1986 / Archaeological Survey of Canada, Canadian Museum of Civilization. Morrison, D.A.
(S.l.) : Canadian Museum of Civilization, 1986.
21 leaves, [4] plates : figures ; 28 cm.
References.
OORD

In 1986, the final phase of archaeological investigations at the Kugaluk site (NgTi-1) were carried out. This work involved the excavation of House 1, portions of its associated middens and two exterior activity areas (B and C). The remains appear to be those of 19th century Nuvurogmiut who concentrated heavily on the exploitation of caribou from spring until early winter. This data may thus provide evidence for a hitherto undocumented aspect of the Nuvurogmiut settlement/subsistence pattern. Additional site survey in the area resulted in the discovery of 5 new sites which may relate to Mackenzie Inuit, Dene and fur trade activities. (J.-L. Pilon)

GOVERNMENT OF YUKON

Department of Education, Yukon Archives

BEAUFORT HYDROCARBON INFORMATION ACQUISITION AND PROCESSING (G.2)

Hydrocarbon development : a Yukon perspective : an annotated bibliography of sources available in the Yukon Archives / Cameron, N.P. Yukon. Dept. of Education. Yukon Archives [Sponsor].
Whitehorse, Yukon : Yukon Archives, 1986.
viii, 536 p. ; 28 cm.
YWA, YWLS, OORD

This bibliography was compiled to provide greater accessibility to the vast amount of information related to northern hydrocarbon development that is available in the Yukon Archives. The geographic emphasis of the bibliography is on Yukon and the Beaufort Sea, but material dealing with the Northwest Territories and Alaska is also included. There are 1015 entries of both published and unpublished works held in the Archives, including monographs, articles in books, government and consultant reports, manuscripts and corporate records. (NOGAP)

GOVERNMENT OF THE NORTHWEST TERRITORIES

Department of Culture and Communications

TRAINING NORTHERNERS IN ARCHAEOLOGICAL TECHNIQUES (H.32)

Preliminary report on the NOGAP archaeological field training program, Drum Lake: the 1985 season / Dept. of Anthropology and Sociology, University of British Columbia. Pokotylo, D. Prince of Wales Northern Heritage Centre. Hanks, C.C.
Yellowknife, N.W.T. : Prince of Wales Northern Heritage Centre, 1986.
ix, 78 p. : figures, tables ; 28 cm.
References.
OORD, NWYGI, NWYWNH

The objective of the NOGAP archaeological field training program was to develop and evaluate a curriculum that can be used to rapidly train native residents of the Mackenzie Valley for work as field assistants on archaeological projects arising from hydrocarbon development in the Beaufort Sea - Mackenzie Valley area. Based upon the site survey and excavation conducted in 1985, a preliminary analysis of the archaeology of Drum Lake was also completed. (Au)

Energy, Mines and Resources Secretariat

SOCIO-ECONOMIC MONITORING SYSTEM, NORTHERN HYDROCARBON DEVELOPMENT (H.8)

Beaufort Region cumulative monitoring indicator catalogue / Energy, Mines and Resources Secretariat.
Yellowknife, N.W.T. : Energy, Mines and Resources Secretariat, 1986.
156 p. : tables ; 28 cm.
COKD, NWYGI

Hydrocarbon development in the Beaufort Region is expected to have a number of socio-economic impacts. A report by Carley (1984) grouped these impacts into issues of community concern which should be monitored. A study by Rolf (1985) looked at the issues of demography, urbanization and industrialization, municipal issues, wage employment, business development, prices and incomes, renewable resource harvesting, education, community control, and the mass media. A second study by Elkin-Hall (1985) dealt with the issues of welfare dependency, family life, health, alcohol use, public safety, and housing. The two studies have been combined to create this package. ... The aim of these studies was to first identify various sources and types of data and then to identify the possible limitations of the data with regard to being valuable indicators. Most of the information came from territorial government headquarters and federal government offices in Yellowknife. ... (Au)

Department of Municipal and Community Affairs

FUNDS FOR TUKTOYAKTUK AND INUVIK COUNCILS TO IDENTIFY IMPACTS AND PLAN FOR DEVELOPMENT (H.2)

Industrial land inventory / Nordzone Consultants Ltd. Town of Inuvik. Northwest Territories. Dept. of Municipal and Community Affairs [Sponsor].
Inuvik, N.W.T. : Nordzone Consultants Ltd., 1985.
147 p : tables ; 28 cm.
(Separate wall-size maps)
NWYGI

This report establishes a data base documenting the existing land use of industrial properties and evaluates the development potential of and restrictions on the vacant industrial land within the Town of Inuvik. Each surveyed industrial property was examined under the following parameters: block and lot number, registered owner, size of lot, present use, buildings,drainage, vegetation, fill, access, adjacent property development, miscellaneous. Each lot is a separate file within the data base table. This report provides the basis for future decisions regarding the use and development of industrial land. Information contained in this report is also available on computer disc. (T. Detlor)

Proposal to prepare a recreational greenbelt masterplan for the Town of Inuvik, N.W.T. / Planarctic. Lavoie, L. Parent, A.M.C. Tutter, B. Woolham, A. Northwest Territories. Dept. of Municipal and Community Affairs [Sponsor].
Inuvik, N.W.T. : Planarctic, 1986.
38 leaves : figures, maps ; 28 cm.
References.
OORD, NWYGI

This report identifies a comprehensive, overall master plan for the parks and greenbelt areas within the Town of Inuvik. It coordinates and provides direction to the various projects identified to develop the town's recreational land, including a town square, marina/ cultural complex, walking trails, playgrounds and beautification of the downtown core. The report will serve as a decision making tool for the Town Council and the Inuvik Recreation Board. (T. Detlor)

Town of Inuvik Navy Road evaluation / Reid Crowther & Partners Ltd.
Calgary, Alta. : Reid Crowther & Partners Ltd., 1986.
39 leaves : figures, tables, maps ; 28 cm.
Appendices.
References.
OORD, NWYGI

This study evaluates the existing traffic and physical condition of Navy Road and estimates the future load resulting from oil and gas development. It also makes recommendations on upgrading the throughfare to be able to handle the forecast traffic. (T. Detlor)

Tuktoyaktuk airport relocation and planning study / Reid Crowther & Partners Ltd. Hamlet of Tuktoyaktuk. Northwest Territories. Dept. of Municipal and Community Affairs [Sponsor].
Calgary, Alta. : Reid Crowther & Partners Ltd., 1986.
v, 138 leaves : figures, tables, ; 28 cm.
(Final report)
References.
OORD, NWYGI

This study assessed Tuktoyaktuk's needs and options with regard to land available for development, especially for residential purposes. Use of the airport site for such development was one of the options examined. Development options were compared in terms of capital and operating costs, and social priorities and issues. The report supported the Hamlet's stated need for relocation of the airport in the long term to allow growth of the community to proceed in an acceptable manner. Development options in other areas of the Hamlet were identified to meet short term demand. (NOGAP)

Tuktoyaktuk airport relocation and planning study - stage 2 design concept and community plan amendments / Reid Crowther & Partners Ltd. Kyllo Planning and Design. Hamlet of Tuktoyaktuk. Northwest Territories. Dept. of Municipal and Community Affairs [Sponsor].
Calgary, Alta. : Reid Crowther & Partners Ltd., 1986.
1 v. (various pagings) : figures, maps, ; 28 cm.
Schedules.
CORD, NWYGI

This study was undertaken to provide the Hamlet Council with design concepts for the optimum use of the airport site and to prepare amendments to the community plan required by changes to the airport land. The first section describes the approach, process and results of the design concept. The second section presents the amendments to the Community Plan in by-law form. (NOGAP)

MUNICIPAL ORGANIZATION, SERVICES AND INFRASTRUCTURE IMPACT PLANNING (H.6)

Planning for resource development impacts on community government operations : background report for working sessions / RMC Resources Management Consultants (N.W.T.) Ltd. Northwest Territories. Dept. of Local Government [Sponsor].
Yellowknife, N.W.T. : RMC Resources Management Consultants (N.W.T.) Ltd., 1986.
87 p. ; 28 cm.
Appendices.
References.
Workshop graphics.
CORD, NWYGI

This report documents the impact management experiences of four community governments during the Norman Wells pipeline project, 1983-1985. The communities examined were Fort Norman, Wrigley and Fort Simpson in the NWT and Assumption in northern Alberta. Very brief sketches of similar experiences in Coppermine, N.W.T. and Anzac, Alberta are also included. The report draws from reports, documents and interviews with community members. The objective was to select experiences demonstrating how changes resulting from resource development may be guided (or opportunities exploited) to sustain or achieve community goals. Community issues and actions are cited in each case. These examples are to be used as case studies in workshops with north Beaufort/Delta community governments to assist them in preparing for similar development pressures. (D. Fisher)

Department of Renewable Resources

RENEWABLE RESOURCES HYDROCARBON DEVELOPMENT IMPACT AND PLANNING GUIDELINES (H.4)

Selection of important areas for wildlife in the Northwest Territories / Salix Enterprises Ltd. Allison, L.M. Western Ecological Services Ltd. Peterson, N.M. Northwest Territories. Dept. of Renewable Resources [Sponsor].
[S.l.] : Salix Enterprises Ltd. Ecological Services Ltd., 1985.
120 p. : figures, tables ; 28 cm.
Appendices.
References.
CORD, NWYRR, NWYGI

This report examines the meaning of "protected areas" of different types in a wide variety of regional, national and international jurisdictions and analyses the values proposed for protection in specified "protected area" proposals within the Northwest Territories. It contains an inventory of all established and many proposed "protected areas" in the NWT. Its intent is as a background document for those parties interested in the implementation of a conservation strategy for the NWT. (Au)

U.S. coastal zone planning and management activities in the Alaskan Beaufort: implications for the Government of the Northwest Territories / M.W. Coastal Futures Inc. Northwest Territories. Dept. of Renewable Resources [Sponsor].
Ottawa : M.W. Coastal Futures Inc., 1986.
70 leaves : figures, tables ; 28 cm.
Appendices.
References.
CORD, NWYRR, NYWGI

The objective of this study is to examine and evaluate US planning and management thrusts in the Alaskan Beaufort and to identify common issues related to development that might affect GNWT interests. The study begins with a review of material relating to the physical characteristics of the region as well as a discussion of what is taking place in the Beaufort coastal zone region from an economic development and administrative perspective. Issues of concern to the GNWT are identified, and a description made of possible development scenarios. Administrative resource management questions relating to the issues are identified, and recommendations are made for action by the GNWT. (Au)

Identification of impact indicators for renewable resource harvesting / Fee-Yee Consulting Ltd. DeLancey, D. P.J. Usher Consulting Services. Usher, P. Northwest Territories. Dept. of Renewable Resources [Sponsor].
[S.l.] : Fee-Yee Consulting Ltd., P.J. Usher Consulting Services, 1986.
49 p. : 28 cm.
Appendices.
References.
CORD, NWYRR, NWYGI

This report reviews and evaluates the impact hypotheses generated by Mackenzie Environmental Monitoring Program workshops to ensure, to the extent possible, that they are accurate and thorough. It also proposes working definitions for such terms as "harvest", "indicator", "harvester" and "effort", and proposes an initial set of indicators which can be used to assess and monitor impacts of development on renewable resource harvesting. (NOGAP)

DETERRENT STUDIES FOR HYDROCARBON DEVELOPMENT IMPACT AREA (H.13)

Bear deterrent study (twelve gauge ferret shell tests) Cape Churchill, Manitoba 1984 / Northwest Territories. Dept. of Renewable Resources. Derocher, A.E. Miller, J.S.
Yellowknife, N.W.T. : The Department, 1986.
ix, 39 p. : figures, tables ; 28 cm.
(File report no. 54)
Appendices.
References.
CORD, NWYRR, NWYGI

Polar bear (Ursus maritimus) deterrent tests using 12 gauge ferret shells (plastic slugs) were completed at Cape Churchill, Manitoba between 19 October - 4 November 1984. A total of 119 tests were peformed (77 experimental and 42 control). No significant differences were found in the time spent in entry or exit between experimental and control bears in the three outer zones. Bears were hit an average of 2.14 times per experimental animal per trial, while control animals were not hit. Experimental bears returned to the bait site approximately 17 hours after being hit with a 12 gauge ferret shell, while control animals returned significantly later at about 43 hours. At least 87.5% of the marked animals returned to the bait site at least once; some bears returned a minimum of seven times. The deterrent shells were fairly uniform in performance with less than 4% noticeably aberrant. Plastic slugs were fired at an average distance of 24 m from the bears. Researchers had an overall accuracy of 89%. Strong winds affected the accuracy of the ferret shells. (Au)

Infra-red detection and acoustic deterrent study Cape Churchill, Manitoba, 1984 / Compuheat Services Canada Inc. Northwest Territories. Dept of Renewable Resources [Sponsor].
Calgary, Alta. : Compuheat Services Canada, 1986.
ix, 49 p. : figures, tables ; 28 cm.
(File report no. 55)
Appendices.
References.
CORD, NWYRR, NWYGI

A two-part study was carried out. ... Part one...tested the feasibility of using an infra-red system to detect (and also census) polar bears (Ursus maritimus) under natural arctic winter conditions, and to assess this system's usefulness as an early warning device. Part two consisted of a preliminary investigation into the feasibility of using an acoustic system...to observe the effects of acoustic stimulation on bear behaviour and to determine any possible optimal frequencies for deterring these animals in their natural habitat. Results of part one indicate that the infra-red wavelength band of 8-14 microns is practical for use in detecting polar bears in their natural habitat, despite adverse weather conditions. ... Results of part two showed that most bears were sensitive to the 0.1 - 9.0 kHz range of frequencies and were most effectively deterred at frequencies of 1.0 - 4.0 kHz. ... Because of the small sample size and the limited testing period, further investigation is recommended to obtain conclusive results. A list of possible influencing factors is offered for consideration for further testing. (Au)

Safety in grizzly and black bear country / Bromley, M.A. Northwest Territories. Renewable Resources. [Sponsor].
[S.l.] : Northwest Territories. Dept. of Culture and Communications, 1986.
24 p. : ill., photos ; 22 cm.
ISBN 0-7708-7151-8.
CORD, NWYRR, NWYGI

This booklet was written for the layman. It includes information on the nature of black and grizzly bears, how to avoid problems when travelling in black and grizzly bear country and what to do if a black or grizzly bear is encountered. Detection and deterrent systems that may be useful to the traveller or worker are discussed. (Au)

Safety in polar bear country / Bromley, M.A. Northwest Territories. Renewable Resources [Sponsor].
[S.l.] : Northwest Territories. Dept. of Culture and Communications, 1986.
24 p. : ill., photos ; 22 cm.
ISBN 0-7708-750-X.
CORD, NWYRR, NWYGI

This booklet was written for the layman. It includes information on the nature of polar bears, how to avoid problems when travelling or working in polar bear country and what to do if a polar bear is encountered. Detection and deterrent systems that are currently available are discussed. (Au)

Human/raptor interaction: management techniques in resource development scenarios / Scott, B.W.A. Northwest Territories. Dept. of Renewable Resources [Sponsor].
Yellowknife, N.W.T. : Dept. of Renewable Resources, 1985.
vii, 83 p. : tables; 28 cm.
(Manuscript report)
References.
OORD, NWYRR, NWYGI

The increased use of land resources in the last two decades, largely prompted by accelerated exploration and development of non-renewable resources, has brought significant pressures to bear on raptors. A survey of literature was undertaken to determine the possibility of developing defensible, biologically based limitations under which resource development might optimally proceed. The extent of the literature is such that spatial, temporal and procedural guidelines may be developed on a site/project-specific basis. No universal or omnibus restrictions are proposed, other than basic minimums, which may be incorporated into the NWT Wildlife Service legislation/ regulatory base. Such minimums are to be augmented by local conditions. Suggestions are given for education programs, increase in the legitimacy of the NWT legal base for habitat and raptor management, and concerns for future study. (Au)

RENEWABLE RESOURCES BASELINE INFORMATION FOR WILDLIFE POPULATIONS AFFECTED BY HYDROCARBON DEVELOPMENT (H.16)

Abundance and distribution of muskoxen and caribou on Banks Island, July 1985 / Northwest Territories. Dept. of Renewable Resources.
McLean, B. Jingfors, K. Case, R.
Yellowknife, N.W.T. : The Department, 1986.
ix, 45 p. : figures, tables ; 28 cm.
(File report no. 64)
Appendices.
References.
OORD, NWYRR, NWYGI

A stratified strip transect survey of Banks Island, NWT was flown between 6 and 14 July 1985. The survey documented distribution and abundance of muskoxen (Ovibos moschatus) and Peary caribou (Rangifer tarandus pearyi). The total number of non-calf muskoxen observed on-transect was 5867 and the resulting estimate was 25,700 + 2050 (SE) muskoxen. Densities ranged from .21 muskoxen/km^2 on south-central Banks Island to 1.52 muskoxen/km^2 in the Thomsen River area. ... The proportion of calves to total classified was 15.3% (137/898). (Au)

ENVIRONMENTAL PROTECTION AND MONITORING OF HYDROCARBON DEVELOPMENT AREAS (H.17)

Spill containment and cleanup course manual/ Stanley Associates Engineering Ltd., 1985. Northwest Territories. Dept. of Renewable Resources [Sponsor].
Edmonton, Alta. : Stanley Associates Engineering Ltd., 1985.
1 v. (various pagings) : figures, tables ; 28 cm.
Appendices.
CORD, NWYRR, NWYGI

This manual provides the background needed to respond to hydrocarbon and chemical spills that occur in the Northwest Territories. It presents information on the characteristics, properties and hazards of spilled materials, provides suggested response, cleanup and site restoration actions, and discusses potential health and environmental effects. It also contains several case histories of actual spill response actions carried out for spills in the NWT. The information presented has been especially tailored to recognize the unique conditions that exist within the NWT. (L. James)

Department of Social Services

SOCIAL IMPACT BASELINE DATA STUDY (H.3)

Community development manual / Stanley Associates Ltd. G.A. Bruce Holdings Ltd. Northwest Territories. Dept. of Social Services. [Sponsor].
Yellowknife, N.W.T. : The Department, 1986.
vi, 38 p. : figures ; 28 cm.
Appendices.
CORD, NWYGI, NWYOS

This manual is to be used as one of many tools by community councils, community development workers and social workers when practicing community development and delivery workshops. It is divided into four sections: 1) community development; 2) organizational maze, which describes formal groups that may exist within a community and identifies organizations outside the community at the regional, territorial and national level that can influence community issues; 3) root cause, and 4) community development models and methods, which describes constructive citizen participation focussing on the three major players--industry, government and communities--in the development of oil and gas resources. Examples of community development provided are specific to the Beaufort area. (NOGAP)

The effects of rotational wage employment on workers and their families in the Beaufort Sea - Mackenzie Delta area: an annotated bibliography, indicators, employment data and recommendations for further research / Northwest Territories. Dept. of Social Services. NOGAP Research Team.
Yellowknife, N.W.T. : The Department, 1986.
66 p. : tables ; 28 cm.
Appendices.
CORD, NWYGI

In the past fifteen years, a significant number of native people in Canada's Arctic have been involved in wage employment in the oil and gas and mining industries as rotational (community) employees. This report contains an annotated bibliography of relevant literature, indicators for impact assessment and recommendations for further research, which is intended to enable the Government of the Northwest Territories to assess the effects of rotation on families and workers in the Beaufort area and devise solutions to identified problems. (NOGAP)